

Clinical Nutrition: Learning the recognition of Initial Hunger (IH)- Mario Ciampolini- University of Florence

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Abstract

Background: The desire to eat may be a decision related to the conditioned responses and with unconditioned body sensations that reflect changes in metabolic biomarkers. The body moods that can be described as hunger have often mechanisms that are conditioned by time, social behavior and sight of food. Blood glucose may be a biomarker of current energy availability and of hunger. General rat and human studies presented that blood sugar deteriorations overlapped with spontaneous feelings of hunger, with metabolic insufficiency and meal initiation.

Objectives: Investigating whether the decision to eat can be delayed until blood glucose is allowed to fall to low levels, when feeding behaviour is (mostly) unconditioned.

Methods: 7-week pilot study was carried out. 158 adults affected by diarrhoea, abdominal pain, and dyspepsia were recruited and randomized to experimental (trained; n=80) and control (untrained; n=78) groups. Subjects of experimental group were trained to ignore meal times and to concentrate to their earliest sensations of hunger or discomfort, so to live glucose concentrations (blood glucose, BG) with glucometer. They were initiated to subordinate their feelings of hunger with BG value. The control group followed their normal routine. In the final analytical session (after compilation of seven days diary) all patients were asked to estimation their preprandial BG and a blood sample was taken to live BG through a glucose auto analyzer.

Statistics: All meal observations from the same age group were pooled. Breakfast was continental and was investigated separately from lunch and dinner, which did not consistently differ from each other. Five breakfast pools and 5 lunch and dinner pools were investigated at baseline as well as under intervention, for a total of 5787 meals. Pre-prandial BG links were examined in 3 meal categories: 1. Baseline; 2. No hunger, which might have been followed by a meal with either low or high fruit or vegetable content; 3. IH, which could be followed by a meal with either low or high fruit or vegetable content.

The following two issues were investigated:

1. The predictive role on BG by emergence of IH in comparison with No hunger.
2. Fruit or vegetable acceptance was consequential to BG measurement, and a correlation can express a causal role only

by BG on low-energy-dense food acceptance. During a meal, a predictive role of low-energy-dense food acceptance on BG might be considered. The relationships between BG and meal energy intake and low-energy food intake were investigated by linear regression analyses. Moreover, each pool under intervention was stratified per quartile of low energy food-acceptance, and BG was compared in quartiles. Here the purpose was to distinguish the predictive role of IH from that of low-energy food-acceptance with regard to BG decrease. Values are expressed as means + SD in the text and as means + SEM in figures. The significance of differences and correlation was analyzed by two-tailed t-test analysis and was set at $P < 0.05$ (Armitage and Berry, 1994). Custom made software was used to calculate meal contents, average BG, anthropometric measures, and to prepare tabulated data for statistical analyses. The statistical analysis was performed SAS 6.11 (The SAS Institute Milan).

Results: At the top of the 7-week training period, estimated and measured glycemic values were found to be linearly correlated within the trained group ($r=0.82$; $p=0.0001$) but not within the control (untrained) group ($r=0.10$; $p=0.40$). Fewer subjects within the trained group were hungry than those within the control group ($p=0.001$). The 18 hungry subjects of the skilled cluster had meaningfully lower glucose levels (80.1 ± 6.3 mg/dL) than the 42 hungry control subjects (89.2 ± 10.2 mg/dL; $p=0.01$). Additionally, the capable starving focuses likely their BG (78.1 ± 6.7 mg/dL; approximation error: $3.2 \pm 2.4\%$ of the measured BG) more accurately than the control group (75.9 ± 9.8 mg/dL; estimation error: $16.7 \pm 11.0\%$; $p=0.0001$). In addition the estimation error of the whole trained group ($4.7 \pm 3.6\%$) was significantly less than that of the control subjects ($17.1 \pm 11.5\%$; $p=0.0001$).

Conclusion: Patients might be trained to accurately estimate their blood sugar and to acknowledge their sensations of initial hunger at low glucose concentrations. These results recommend that it's likely to find out a social difference between unconditioned and conditioned hunger, and to modulate intake to realize three IH arousals per day.

Reports on Initial Hunger: One to 15 training days served to learn the preprandial distinction in body feelings between those promoted by conditioning factors (appetite) and those developing only after stimulation of unwanted signals of Initial

Hunger (after meal suspension). The same type of feeling signalled Initial Hunger in the same subject for over 80% of instances, and sometimes 1 or 2 further types emerged in association with the usual feeling or substituted it. Stomach feelings often emerged together with modest change in cognitive activity. The reasoning feeling was usually mild, even transient, and without activity break. BG fallen below 3.0 mmol/l in 11 of 556 meals at starting point, and in 44 of 1298 meals under intrusion (NS). The decrease under 2.5mmol/l was observed in 2 baseline meals and 7 under intervention (NS). Fainting or other complaints were not reported. The mealtime was suggested by the Initial hunger, and the meal or a fruit snack was consumed after a few minutes by infants, or in the successive hour in older subjects. Social habits and established mealtimes were maintained, so 11- 30% of meals were eaten without Initial hunger. At mealtimes, the planning revealed to be successful in 70-89% of meals under intervention, i.e. Initial hunger appeared in these fractions before meal intake. Intense or painful gastric emptiness emerged in 5 subjects with *Helicobacter pylori* infection for a few days during intervention. This transformed epigastric insight was related with unpredictable BG measurements, ranging from high to excessively low. Some hand workers reported physical weakness and used this signal as an Initial Hunger onset. Strength and activity were soon restored with the meal and no loss of body weight was observed. Obsessive abstention from eating, mealtime postponement to increase hunger or ignoring Initial hunger with loss of meals was discouraged and was only occasionally observed in 6 adults.

Note: This work is partly presented at 4th International Conference and Exhibition on Nutrition, October on 26-28, 2015 held at Chicago, Illinois, USA.